



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

SOME PROBLEMS OF THE WATER WORKS EXECUTIVE¹

BY GARRETT O. HOUSE

In considering this subject, it seems to me fitting that we should analyze briefly, if you please, the qualifications which a water works executive must have, because in order to properly operate and manage a water works he must have some specific qualifications.

The water works executive is expected to administer the affairs of his office efficiently, and inasmuch as the efficiency equation involves the proper way to do work, and also the way work is performed, he must be qualified to know how the different divisions of his department should be conducted, how individual work should be performed, and he must also know how the actual work is conducted and how much is accomplished. Some one has said that an executive is called upon to make rapid decisions and is sometimes right, that most of his answers must be "yes" or "no." This is probably borne out in the experience of every executive and emphasizes the importance of knowing how each branch of his department should be operated, and also how it is operated. He must also know the means available in men and equipment. It is possible for him to determine how work is done by records properly arranged, and results. The way work should be done he must know either through his own experience or the experience of others of recognized ability. He must be idealistic. How little worth while is ever accomplished without an ideal. It is the real incentive for accomplishment. The ideal of the water works executive is furnishing an adequate amount of pure and wholesome water for all purposes to all citizens indiscriminately, under reasonable conditions and at reasonable rates. This is the main problem, and its fulfillment involves many lesser problems.

In speaking of an ideal water works organization it has been said that the manager or executive must have, in addition to foreknowl-

¹Read before a meeting of the Minnesota Section at Minneapolis on December 2, 1916.

COMMISSIONER OF PARKS
PLAYGROUNDS & PUBLIC BLDG

PURCHASING AGENT

WATER SUPPLY DIVISION

ENGINEERING

COLLECTION
AND
STORAGE

PUMPING

DISTRIBUTION
MAIN
EXTENSIONS

DISTRIBUTION
REPAIRS
MAINTENANCE

DISTRIBUTION
SERVICE
CONNECTIONS

METERS

Principal Asst
Engineer
Assistant
Engineer
Rodman
Stenographer
- Clerk
Junior Civil
Engineer
Draftsman

Foreman
Laborers
Labs
Watchman
Teams

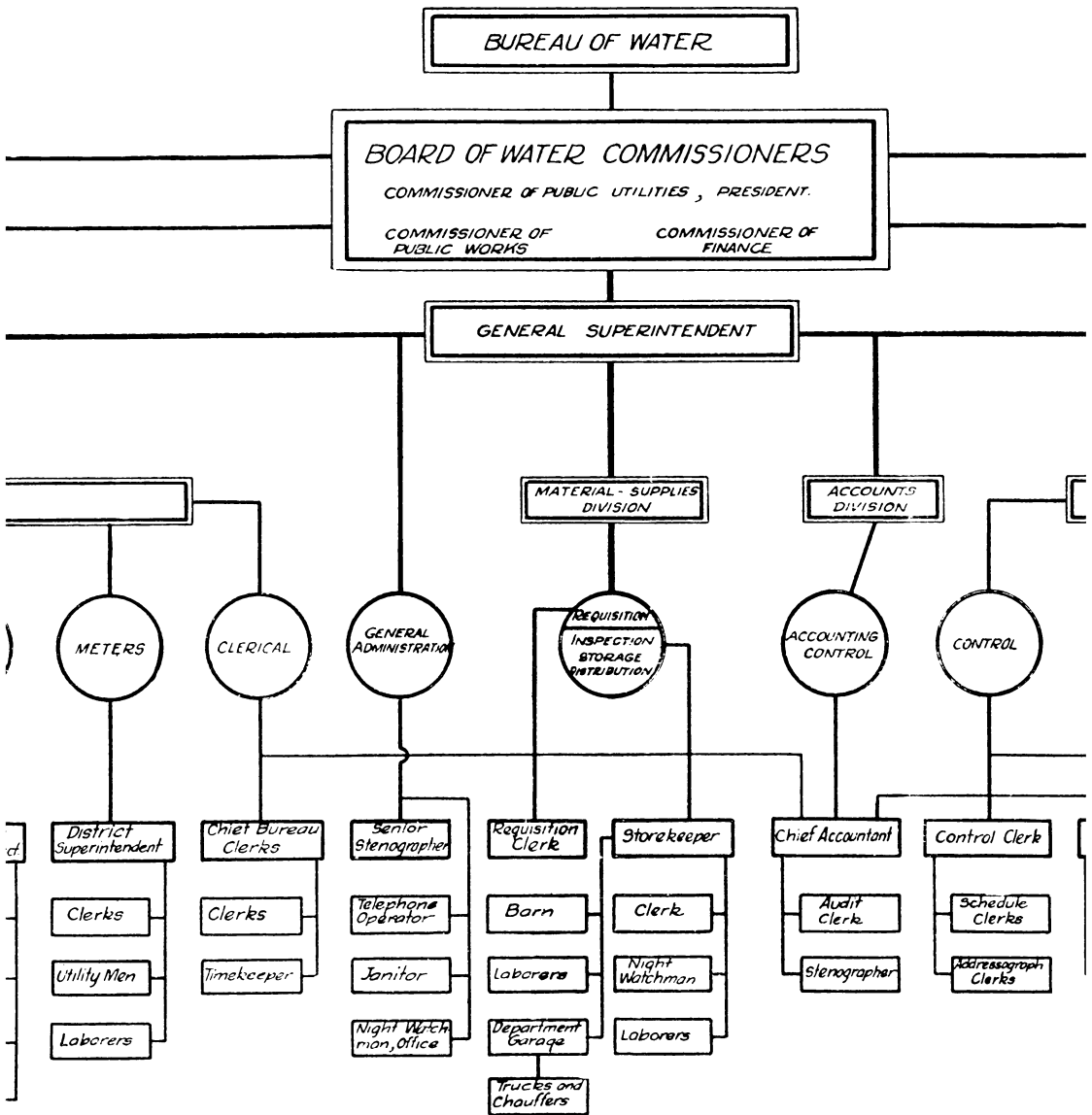
Supt. Mechanical
Equipment
Asst Supt Mech
Equipment
Engineers
Pump'g Stn
Firemen
Dist. Utility
Inspector
Keeper H.S.
Reservoir
Screen
Cleaner

Foreman
Utility Men
Laborers
Motor
Vehicles
Street
Watchman

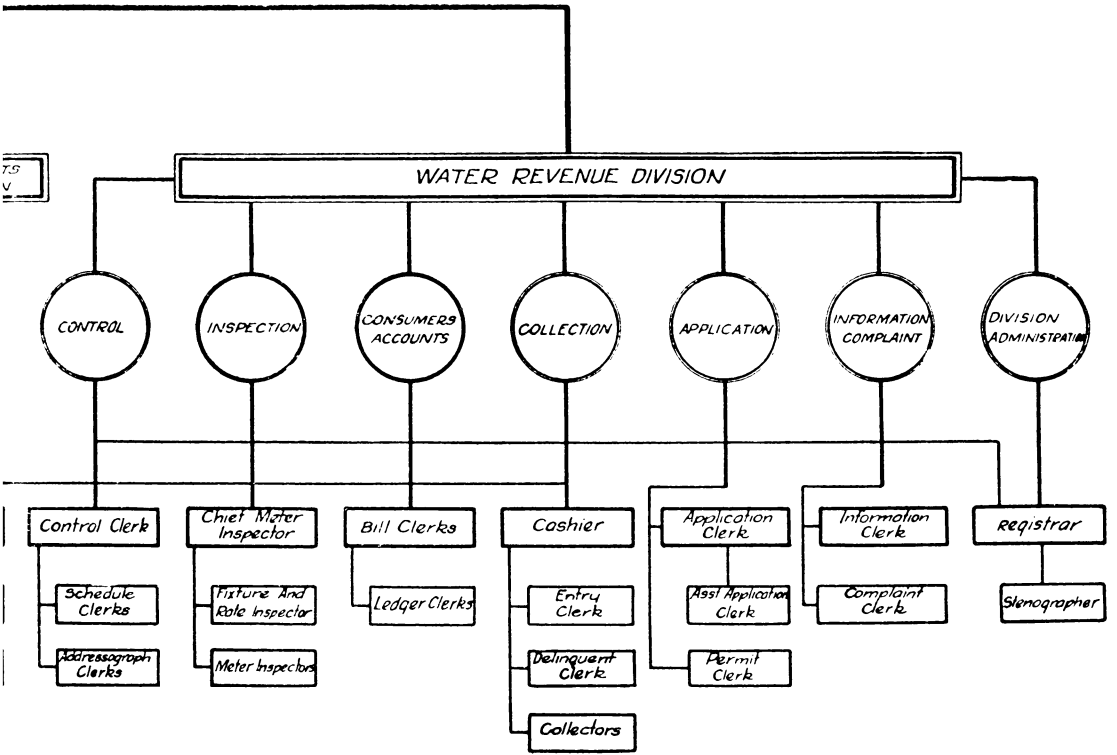
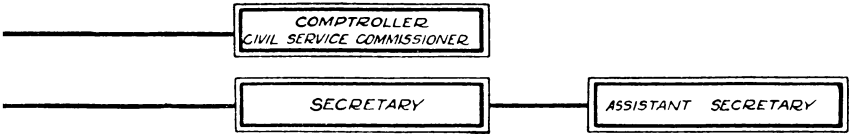
Foreman
Utility Men
Laborers
Motor
Vehicles

District Supt
Service Connect
Foreman
Utility Men
Laborers
Motor
Vehicles

District
Superintendent
Clerks
Utility Men
Laborers



ORGANIZATION CHART OF THE BUREAU OF WATER OF ST. PAUL, MINN.



edge of water works work, that is, experience, resourcefulness in high degree, initiative, and ability. I think we will all agree to that, but is not his success as an executive measured also, and to a very large extent, by his personality? I am not thinking of a water works executive as one who plans his work separate and apart from his associates and who executes by written order, but of a man who knows full well what is to be done and directs its accomplishment by coöperation with those associated with him; who works through the organization which is set up, to accomplish his ideal; who thinks of the organization as "a systematic coöperation of a body of men for a common purpose," the common purpose being to reach his ideal. His personality is reflected in every branch of his organization. He is the leader, or executive. His integrity, his enthusiasm, his tact, his character, has its influence upon each individual in the organization. As John Stewart Mill has said, "the initiative of wise and noble things comes, and must come, from individuals, and generally first from one individual." Personality is individual. It is the contribution of ourselves, not of muscle, or money, or brains; it is that which makes an organization better for our having organized, deputized and supervised it.

In order to bring out the problems of the water works executive, I will, because of my intimate knowledge and connection with the bureau of water in St. Paul, analyze the organization chart of the water department of the city of St. Paul. As will be noted on the accompanying graphic representation of our organization, the commission form of charter under which the municipality of St. Paul is governed, provides that the affairs of the water department shall be administered through an elective board of water commissioners, of whom the commissioner of public utilities is president, and the commissioners of public works and of finance are members. The charter provides that the commissioner of public utilities shall administer, as president of the board of water commissioners, all of the general business of the water department; that the commissioner of public works shall have charge of all engineering and construction; and the commissioner of finance shall collect all revenues. The charter also provides for a central purchasing agent who purchases all supplies and material used by the water department; also that the comptroller shall prescribe the method of accounting and audit all accounts of the water department. He also, as civil service commissioner, certifies to the eligibility of all employees and also

audits all payrolls. From this it is evident that the activities of the water department are, by charter provision, placed in the hands of many individuals. Since all of these activities are dependent and interlock one with the other, it was deemed necessary and advisable for each of the elective officials to deputize one person to administer, under their direction, the authority which the charter has vested in them. To this person has been given the title of general superintendent and he becomes the executive of the water department.

The first important branch of duty which falls to the lot of the general superintendent can be properly considered under the head of general administration, in which is involved the problem of making rules and regulations for the conduct of all water works business.

Rules and regulations are really the articles of agreement between the consumer and the water works, under which the water works company or department agrees to render service and the consumer agrees to comply therewith. Usually all forms of contract procedure which the applicant for water service signs include or state in a different way some of the rules and regulations of the department. To prepare rules which will be reasonable, be general in application and not discriminate in favor of any person, is a real problem. And yet the problem is rendered more easily solved when the executive keeps constantly in his mind that all rules must be based upon reasonableness, and if, in addition to considering the needs and requirements of the water department, he also considers the needs of the water consumers. In other words, he must place himself in the consumers' position and form rules and regulations in accordance with the Golden Rule. Rules and regulations are of great importance to the welfare of the water department, but none should be made unless it can be enforced or lived up to; all should be reasonable, fair to the water works and fair to the consumer.

A water works as a rule is a monopoly and the opportunity is given to make unreasonable rules, decidedly in favor of the company or department. Water is a necessity and no commodity contributes so much to the health and prosperity of a community as water, therefore the service should be within the reach of all.

Under this same general heading may be considered rates, which, however, are determined not upon theory but from actual facts. The water works executive, having made the rules and regulations and rates under which the department is to be operated, now turns his attention to perfecting an organization through which all the

various activities of the department may be carried on, and the rules and regulations laid down may be carried out.

You will note that the organization of the water department of the city of St. Paul is divided into four separate divisions, water supply division, water revenue division, accounts division, and materials and supplies division. Time will not permit the consideration of problems of the water works executive which involve engineering. Let us consider, therefore, first, what problems, if any, are to be found under the heading "Distribution, main extensions." How should extensions be made in the newly developed portions of the city? In St. Paul, one general rule is followed. If the street upon which the extension is asked, is graded to the grade established by the city engineer, and if there is a reasonable demand for water on this street, a petition for main extension is usually granted by the board. This liberal policy can be pursued in St. Paul because of the fact that a frontage tax is permitted under its charter amounting to \$1 per front foot of all property facing on the street upon which the main is laid, which reimburses the department for the expense of installing the main.

An engineering problem of great importance is also involved in the matter of extension of mains, particularly in a rapidly growing city, concerning which time will not permit a discussion in this paper. The location of the water main in the public street at any other point than at the center involves a greater expense to owners on one side of the street than the other in making a service connection.

The problem of taking care of repairs and maintenance of water mains and appurtenances must, I think, be worked out in each individual case, because conditions vary in almost every city. One thing, however, is certain, that the selection of men to perform this class of work must be in every sense emergency men.

Under the next sub-division, "Distribution, service connections," many problems are involved, including the materials of which service connections are to be made, the method of installing them, whether by the water department or a licensed plumber in the service of the owner of the property to be served, the size permitted, and the location of the control fittings. In St. Paul extra strong lead pipe is used for all service connections up to and including 1½-inch; for 2-inch, galvanized iron pipe is used, and for larger service connections, cast iron. All services are laid by the water department. Not only is there a question of who should lay the water

service connection in the street, but there is also the question of who should maintain it. In St. Paul, at present, it is laid by the water department at the expense of the owner of the property and thereafter maintained by the water department, also at the expense of the owner of the property. From experience I would say that this arrangement is not the best, and I am preparing a new schedule of rates for laying service connections which will include the cost of their maintenance throughout a period representing their reasonable life, which I will ask the board of water commissioners to put into effect on January 1.

In this division we also have the problem which, as yet, remains unsolved, service connections to private fire supplies. This has been a subject of much discussion in engineering and water works societies, and there is a decided difference of opinion. It is a most important problem and I believe should be solved by accepting a procedure midway between the theory of the National Board of Fire Underwriters and the practice of some water works engineers and executives.

It seems to me that the provisions of the National Board of Fire Underwriters with respect to the size of service connection necessary for supplying automatic sprinkler equipment is in many cases entirely too liberal and does not take into consideration the elements which must enter into a determination of water supply. The board of fire underwriters requires, for instance, that a 6-inch service connection must be supplied for sprinkler equipment located in one fire area in excess of 85 sprinkler heads. No consideration is given the matter of pressure, and notwithstanding the fact the National Board indicates that one sprinkler head will reasonably protect 10 square feet of area, the manufacturers of automatic sprinkler equipment very often plan and install sprinkler equipment so that one head is placed to considerably less than 10 square feet of area, which makes, under the rules of the National Board of Fire Underwriters, the larger size service connection necessary.

The use of water from the fire service for other purposes than extinguishing fire, is a problem which confronts the water works executive, and is generally dealt with either by sealing and inspecting all drip valves on the system, or by placing some form of meter or detector in the service line. In my judgment, a clear distinction should be made between supplies to be used for extinguishing fires and those to be used for domestic purposes, and under no considera-

tion should domestic service be taken from a fire supply line. The charge made for private fire service should include water consumed for periodical testing of the system, losses from evaporation and water used for extinguishing fires. This being the case, it is only necessary to introduce in the service connection a device which will indicate that water has been used. The question of how much is not important. This will effectually prevent continuous use of water for any purpose other than that for which the service is installed. If it is found, for instance, that the service is used more frequently than would be necessary for inspection or make-up water, inquiry can be promptly made and the proper remedy applied. It is, I think, important that the consumer to whom private fire service is supplied, should be required to give a bond of sufficient size to guarantee fulfillment of contract provisions. There is also the necessity for the adoption of uniform practice in this respect by all water works operated under the same general conditions.

The next problem which confronts the water works executive is that of meters, and there is little question but the selection of water meters is a problem to every water works executive. This problem is more complicated in a municipality where the charter and ordinance provisions are in force similar to those in St. Paul, where the central purchasing agent is required to award a contract for purchases exceeding in amount \$500, upon formal bids, to the lowest responsible bidder. This makes it necessary for the executive to prepare specifications which will either represent the water meter his judgment considers the best, which would be considered discriminatory, or else prepare an open specification which shall permit the manufacturers of all water meters to bid and be satisfied to accept that meter which will be furnished for the lowest price. Two years ago, when this provision was first in effect in St. Paul, bids were received for water meters upon a general specification, and after tabulation, the contract committee asked the writer to make a recommendation. Knowing full well the provisions of the charter with respect to purchases of all supplies, the following recommendation was made:

It is my judgment that the city should buy that meter which, in addition to complying in all respects with the specifications, represents the lowest unit cost during its life, the determination of which involves an equation having only one known quantity (first cost) and several unknown quantities.

Meter representatives and others maintain that the records of the department should indicate the cost of maintenance of the meter. This is true, but notwithstanding the fact that the same size and make of meter purchased at the same time and performing the same service for several years, will require distinctly different repairs and maintenance, and be distinctly different in the matter of test at the end of this period, the average represents the best information obtainable and would be quite satisfactory. The problem is how to introduce such a provision in the specifications.

For both service connections and meters, history cards are started when the service connection is installed or the meter is purchased. Upon these cards are recorded all that happens to the service connection or the meter, including all elements of expense. These cards are found of great value because they represent the life history of either the service connection or the meter.

The problems involved in the material and supplies division are very interesting. Time will not permit their analysis in this paper.

The accounts division is of great importance but is not always given the attention it should have.

The water revenue division, as you well know, represents the activities of the department of the water works which come in direct contact with the public. On this account many problems are involved, particularly in its organization and administration. You will note that the organization of the St. Paul water works is administered by a registrar who directs all of the sub-divisions. These sub-divisions are made so that each man has a separate and distinct branch of business to transact, affording the person who has business with the department the facility of transacting it rapidly and avoiding what is so common, being referred from one division to another. Information and complaints are given very careful consideration in our organization, and the heads of these sub-divisions are trained and cautioned to always assume that every complaint is real to the complainant and not to take uncomplimentary remarks about the department as personal. It is here that calmness and courtesy count; our slogan is "Service."

In making up the organization chart to which reference has been made, it is intended to classify and group the different functions logically, making a single officer responsible to the general superintendent for the direction of each function. The functions of each sub-division have been clearly defined by bulletin and the duties

and lines of authority of each position have been standardized and defined. While experience has shown that this organization has operated smoothly and accomplished very definite and satisfactory results, it is also shown that slight readjustment in some of the divisions will give better results and these changes will be made at an early date. An executive must train himself to be awake, to make changes in his organization when experience shows that the change is necessary and will effect an improvement in administration.

I would like to add just a word or thought as to the routine business of a water works executive, the problems he is called upon to solve other than through his organization.

It is important, of course, and necessary that he should refer all matters possible to his associates, to the heads of different divisions, rather than attempt to work them out himself; this is to avoid confusion. This, of course, is absolutely necessary, but there are many matters which come to him which require his individual effort. He must be able to differentiate between the big things and the little things, the important things and the unimportant things, holding only for his own personal consideration that which he must of necessity do or where the solution has an important bearing on the general plan of the department.

I have heard a water works executive with whom I am well acquainted express himself to the effect that unfinished business was a most unsatisfactory problem to solve; that he recognizes the fact that to solve a problem properly it is necessary to concentrate upon it; to analyze the fundamentals and work upon it to its conclusion. How seldom is this possible for the ordinary executive to do. He no sooner gets started upon a problem, if he attempts to do it during office hours and in his office, and gets his mind thoroughly fixed upon it, when he is interrupted by the introduction of some other equally important business, which so diverts him that he loses the thread of what he was working on and thereby seriously diminishes his ability to make the best solution. Then again, how often problems are before him which cannot be brought to a conclusion, but must be left in the unfinished state until late developments.

The executive is called upon also to administer or prescribe discipline and exercise authority. Here perhaps, as well as anywhere, is shown his personal characteristics. He must use the hand of steel enclosed in the glove of velvet. He must have a highly developed sense of fairness, be firm and yet reasonable, and above all, practice the Golden Rule.